

Robust Propulsion Control for Improved Aircraft Safety, Phase I

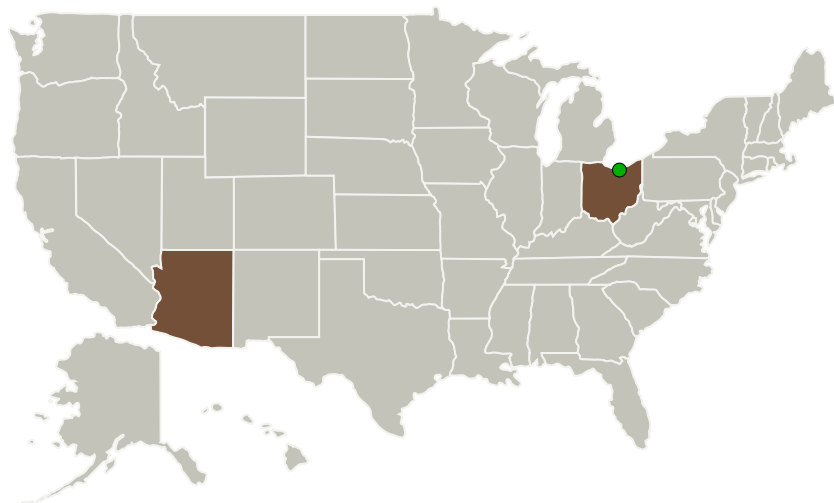
Completed Technology Project (2011 - 2011)



Project Introduction

Scientific Monitoring, Inc. proposes to develop a robust propulsion control approach to facilitate control law design and simulation-based validation. The proposed approach integrates system identification and robust control design, specifically tailors it to handle large perturbations and model uncertainties affecting engine operations, and provides a framework for successive design optimization through iterations. The integrated and iterative design methodology will reduce the cycle time in propulsion control design and validation to maintain engine operations in the presence of adverse conditions, such as engine icing, foreign object damage, and high angle of attack. In Phase I, A proof-of-concept (POC) simulation will be conducted to demonstrate the merit of the robust control approach in the presence of larger than normal variations in the design model. The control design and closed-loop POC will use the NASA-developed C-MAPSS generic engine model as the simulation framework. The anticipated benefits of the proposed innovation are to reduce design cycle time and increase robustness of the controller design, while optimizing the closed-loop system performance.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Scientific Monitoring, Inc.	Lead Organization	Industry Minority-Owned Business	Scottsdale, Arizona
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations

Arizona	Ohio
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Project Transitions

**February 2011:** Project Start**September 2011:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/138470>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Scientific Monitoring, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

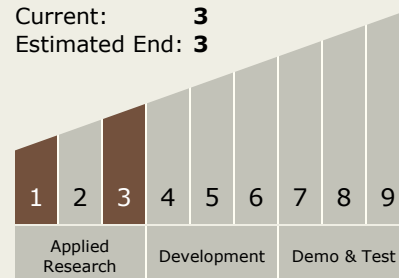
Carlos Torrez

Principal Investigator:

Link Jaw

Technology Maturity (TRL)

Start: **1**
 Current: **3**
 Estimated End: **3**



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Technology Areas

Primary:

- TX01 Propulsion Systems
 - └ TX01.3 Aero Propulsion
 - └ TX01.3.11 Engine Icing

Target Destinations

The Sun, Earth, The Moon,
Mars, Others Inside the Solar
System, Outside the Solar
System